
5 Fig. 1

Reference signal

Modulated carrier

3: Phase comparator

4: Charge pump

5: Loop filter

10 7: Modulation data generator

8: Pre-distortion filter

Frequency data

10: $\Sigma \Delta$ modulator

15: Calibration data generator

15 18: Demodulator

31: Memory

32: Error detection means

33: Frequency characteristic correction means

40: Selector

20 42: Modulating signal generator

Fig. 2

Without modulation 42: Modulating signal generator

Frequency data (f1)

25

Fig. 3

Charge pump

Modulated carrier

18: Demodulator

31: Memory

30 32: Error detection means

33: Frequency characteristic correction means

15:

High

Reference signal

1: Voltage-controlled oscillator

2: Frequency divider

3: Phase comparator

4: Charge pump

10 5: Loop filter

7: Modulation data generator

8: Pre-distortion filter

Frequency data

10: $\Sigma \Delta$ modulator

15 12: Register

13: Comparison means

14: Filter characteristic control means

15: Calibration data generator

Control signal

20 24: Lookup table

27: Correction means

Gain [dB]

25 A1: Frequency characteristic of PLL (with variation)

B1: Frequency characteristic of pre-distortion filter

C1: Frequency characteristic obtained after synthesis

Frequency [Hz]

30 Fig. 6

Gain [dB]

Frequency [Hz]

Fig. 7

Gain [dB]

Direction of correction

5 B2: Frequency characteristic of pre-distortion filter obtained after correction

C2: Frequency characteristic obtained after synthesis

Frequency [Hz]

Fig. 8

10 Modulating signal component (f_{CAL})

Modulating signal component (f_{BW})

Amplitude (H)

Time (t)

15 Fig. 9

Reference signal

Modulated carrier

1: Voltage-controlled oscillator

2: Frequency divider

3: Phase comparator

20 4: Charge pump

5: Loop filter

7: Modulation data generator

8: Pre-distortion filter

Frequency data

25 10: $\Sigma \Delta$ modulator

12: Register

13: Comparison means

14: Filter characteristic control means

15: Calibration data generator

30 Control signal

17: Correction means

20: Charge pump current control means

Fig. 10

Gain [dB]

Direction of correction

- 5 A2: Frequency characteristic of PLL obtained after correction
- Frequency [Hz]

Fig. 11

Reference signal

Modulated carrier

- 10 1: Voltage-controlled oscillator
- 2: Frequency divider
- 3: Phase comparator
- 4: Charge pump
- 5: Loop filter
- 15 7: Modulation data generator
- 8: Pre-distortion filter
- Frequency data
- 10: $\Sigma \Delta$ modulator
- 12: Register
- 20 13: Comparison means
- 14: Filter characteristic control means
- 15: Calibration data generator
- Control signal
- 27: Correction means
- 25 Demodulator

Fig. 12

Reference signal

Modulated carrier

- 1: Voltage-controlled oscillator
- 30 2: Frequency divider
- 3: Phase comparator
- 4: Charge pump

5: Loop filter

7: Modulation data generator

8: Pre-distortion filter

Frequency data

5 10: $\Sigma \Delta$ modulator

12: Register

13: Comparison means

14: Filter characteristic control means

15: Calibration data generator

10 Control signal

19: Low-pass filter

27: Correction means

Fig. 13

15 Gain [dB]

A3: Frequency characteristic of PLL (large attenuation in an out-of-band high-frequency range)

C3: Frequency characteristic obtained after synthesis

Frequency [Hz]

20

Fig. 14

Fixed frequency reference signal

Modulated carrier signal

36: Phase comparator

25 40: Loop filter

30: Multilevel frequency divider

Digital modulation data

46: Digital compensation filter

56: $\Sigma \Delta$ modulator

30 Carrier signal

Fig. 15

Gain [dB]

A: Frequency characteristic of PLL

B: Frequency characteristic of digital compensation filter

C: Frequency characteristic obtained after synthesis

5 Frequency [Hz]

Fig. 16

Gain [dB]

Frequency [Hz]

10

図 1

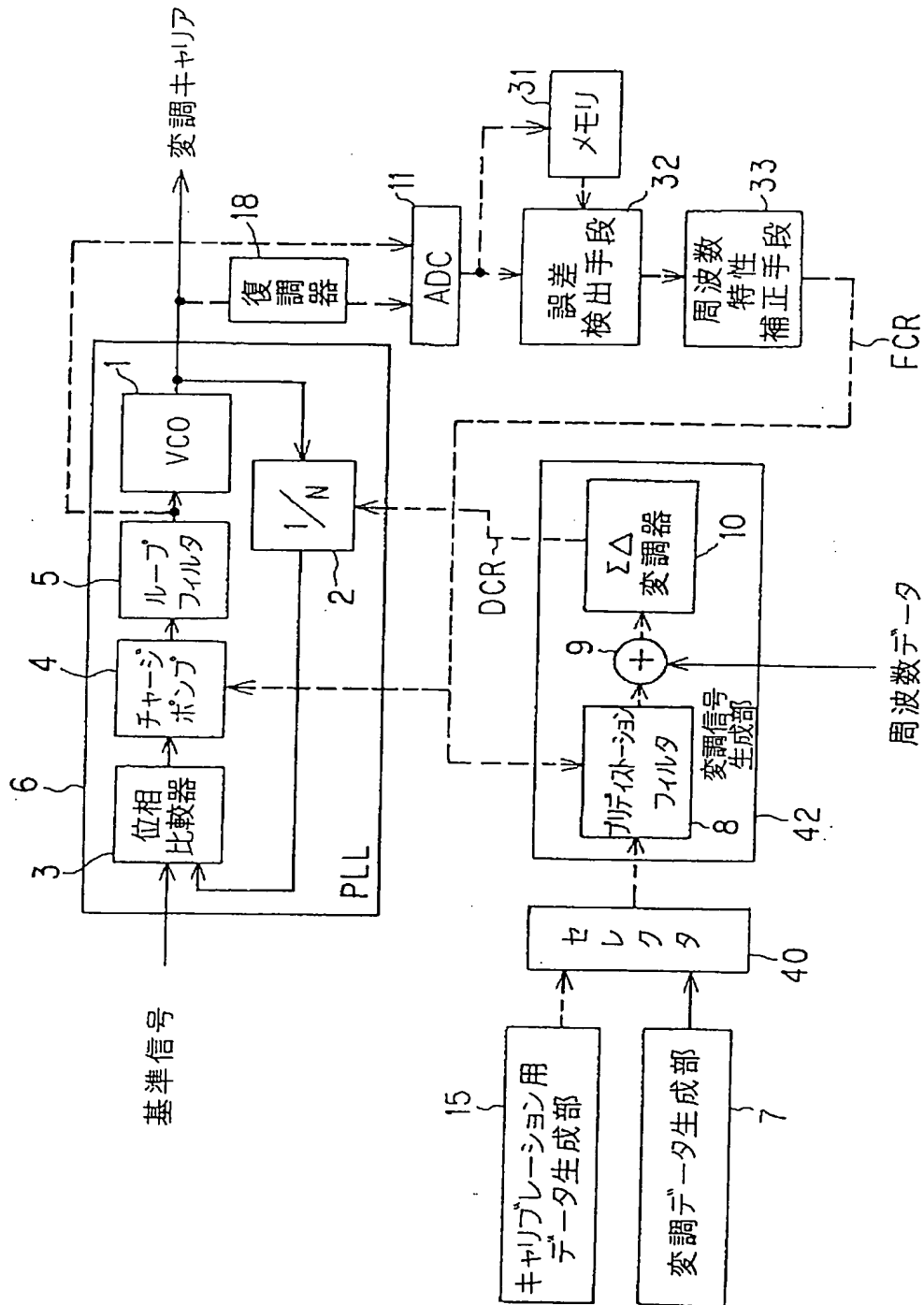


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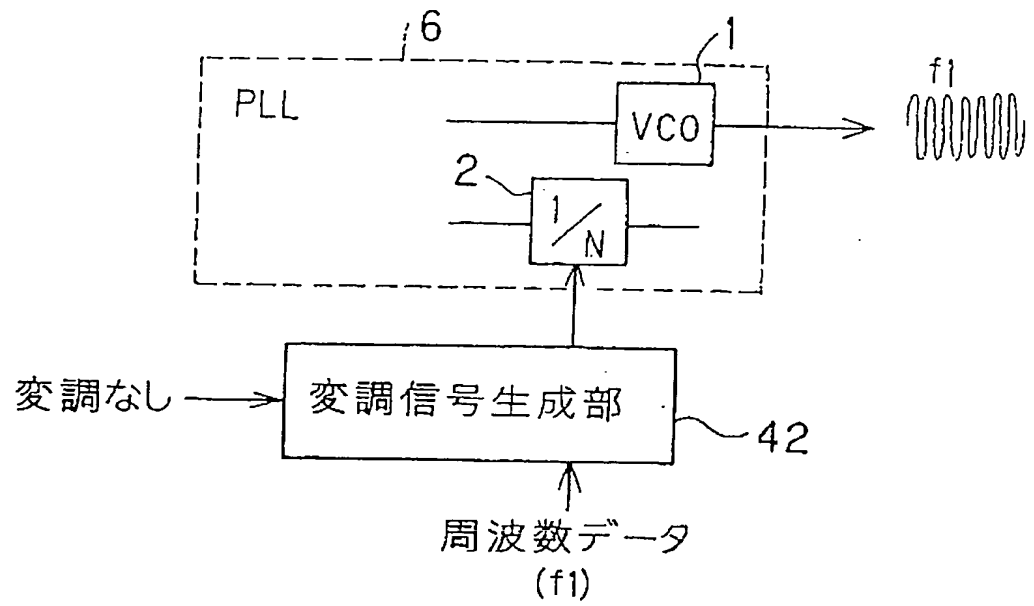


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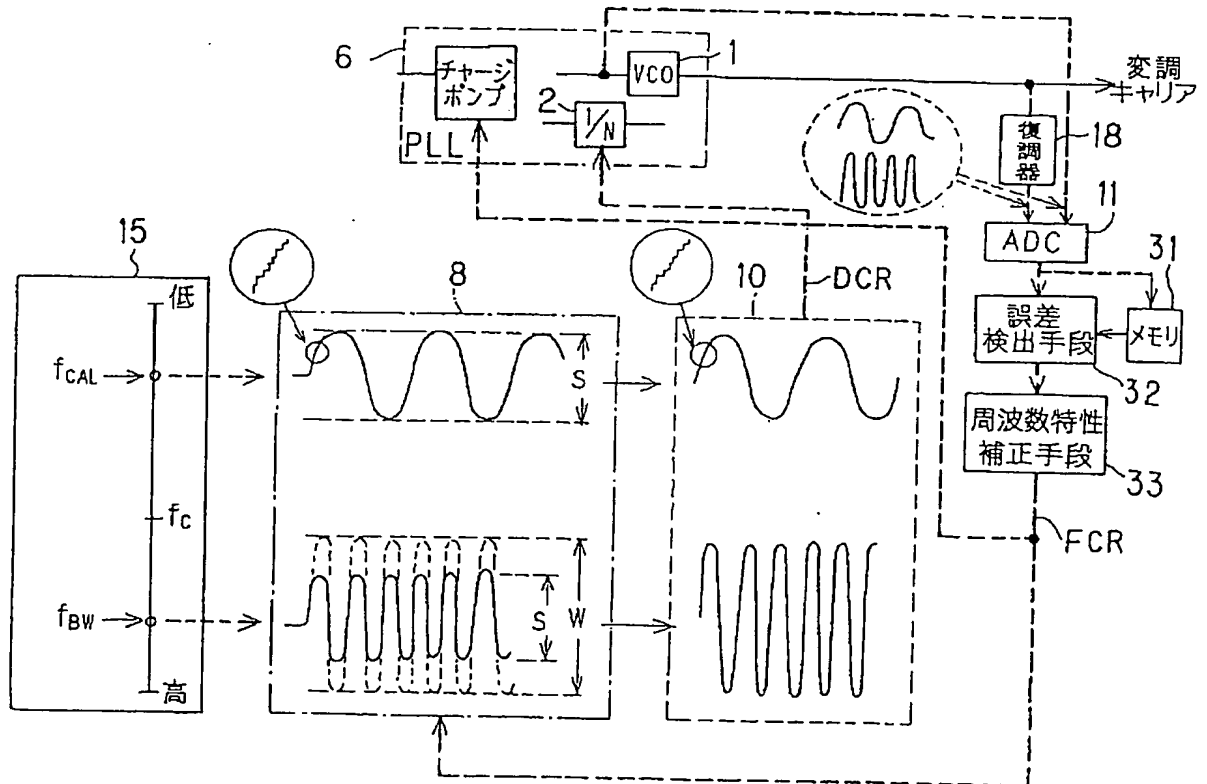


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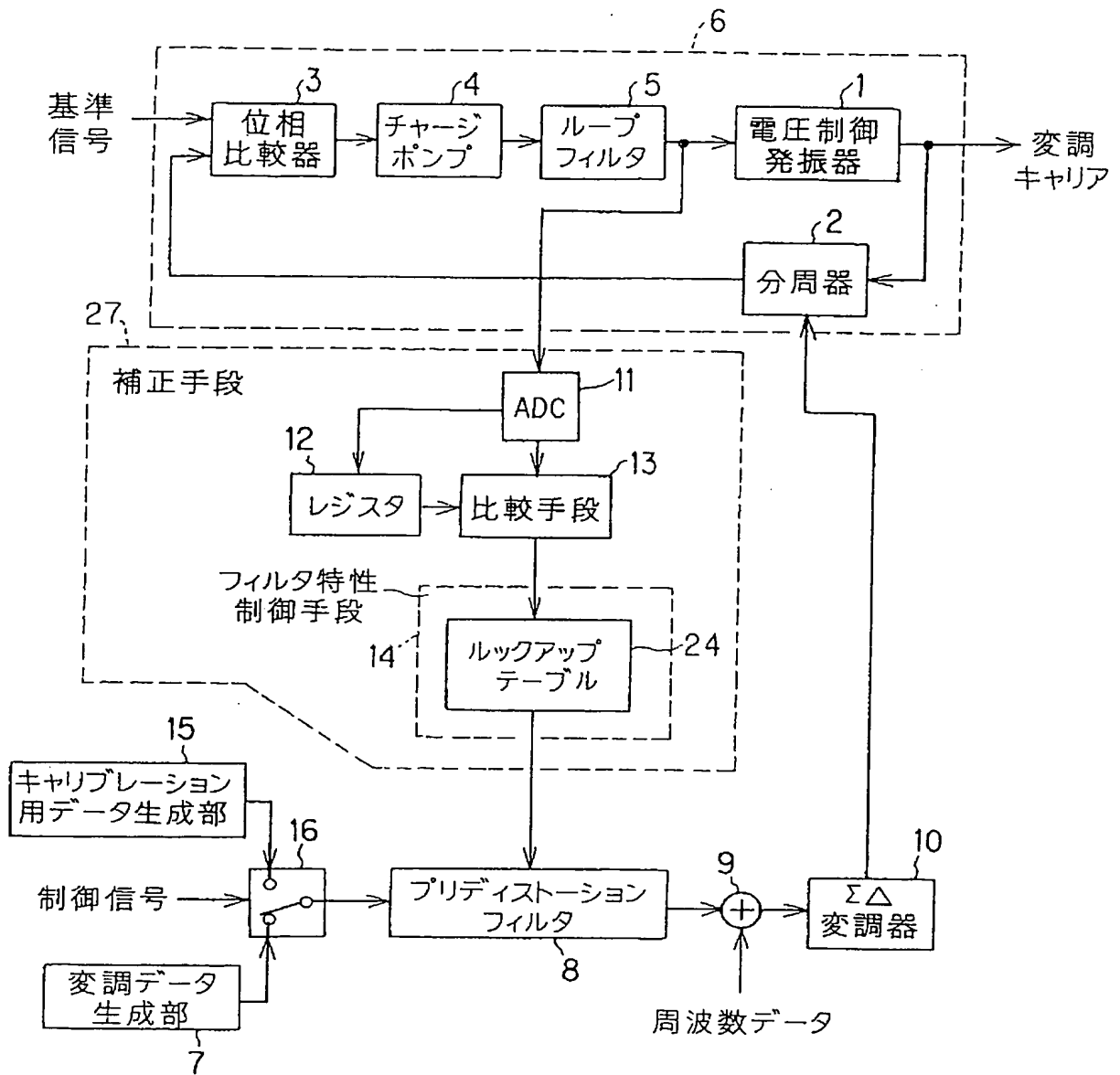


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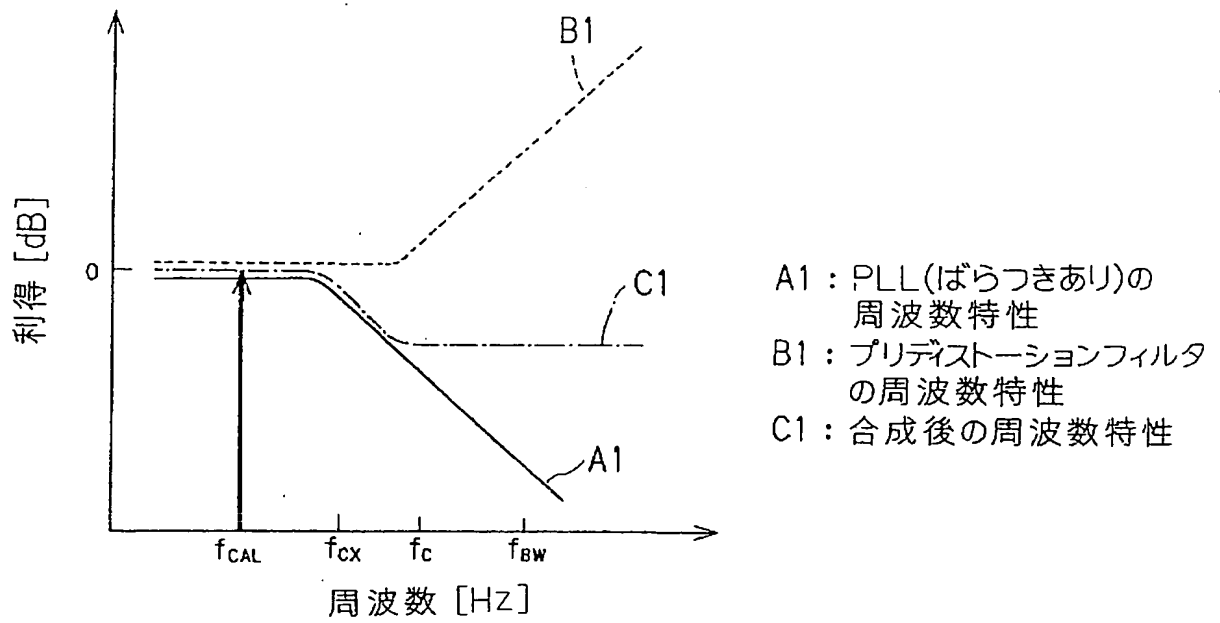


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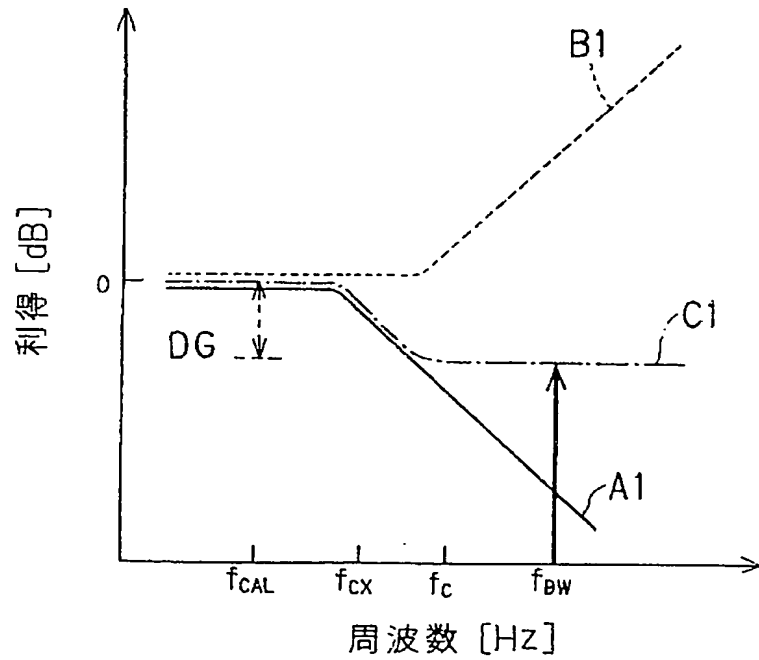
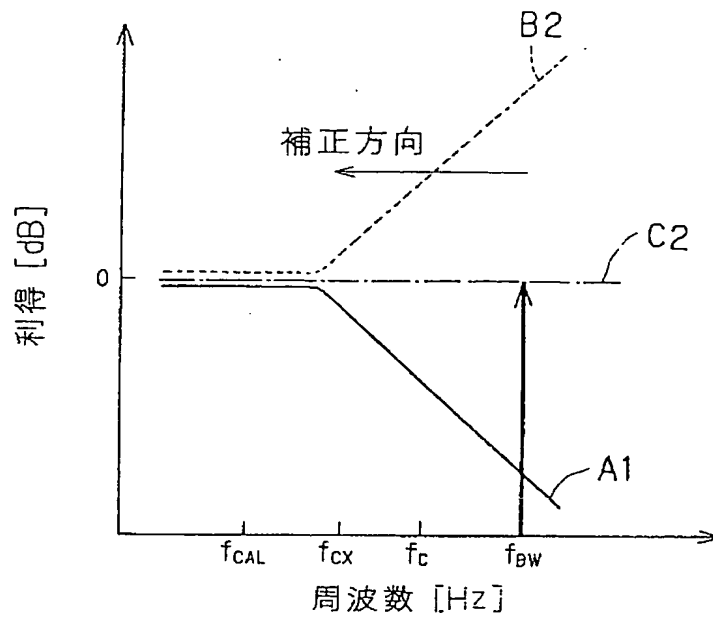


図 7



B2 : 補正後のプリディストーションフィルタの周波数特性
C2 : 合成後の周波数特性

図 8

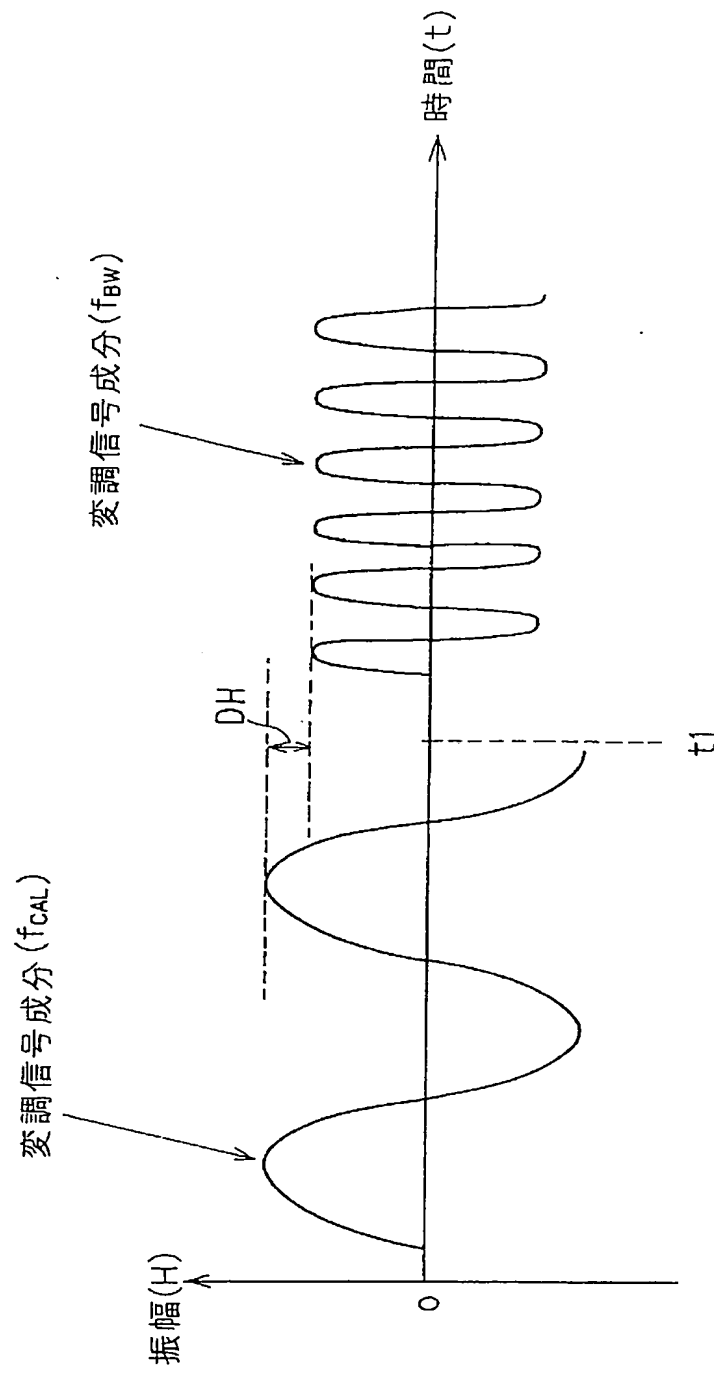


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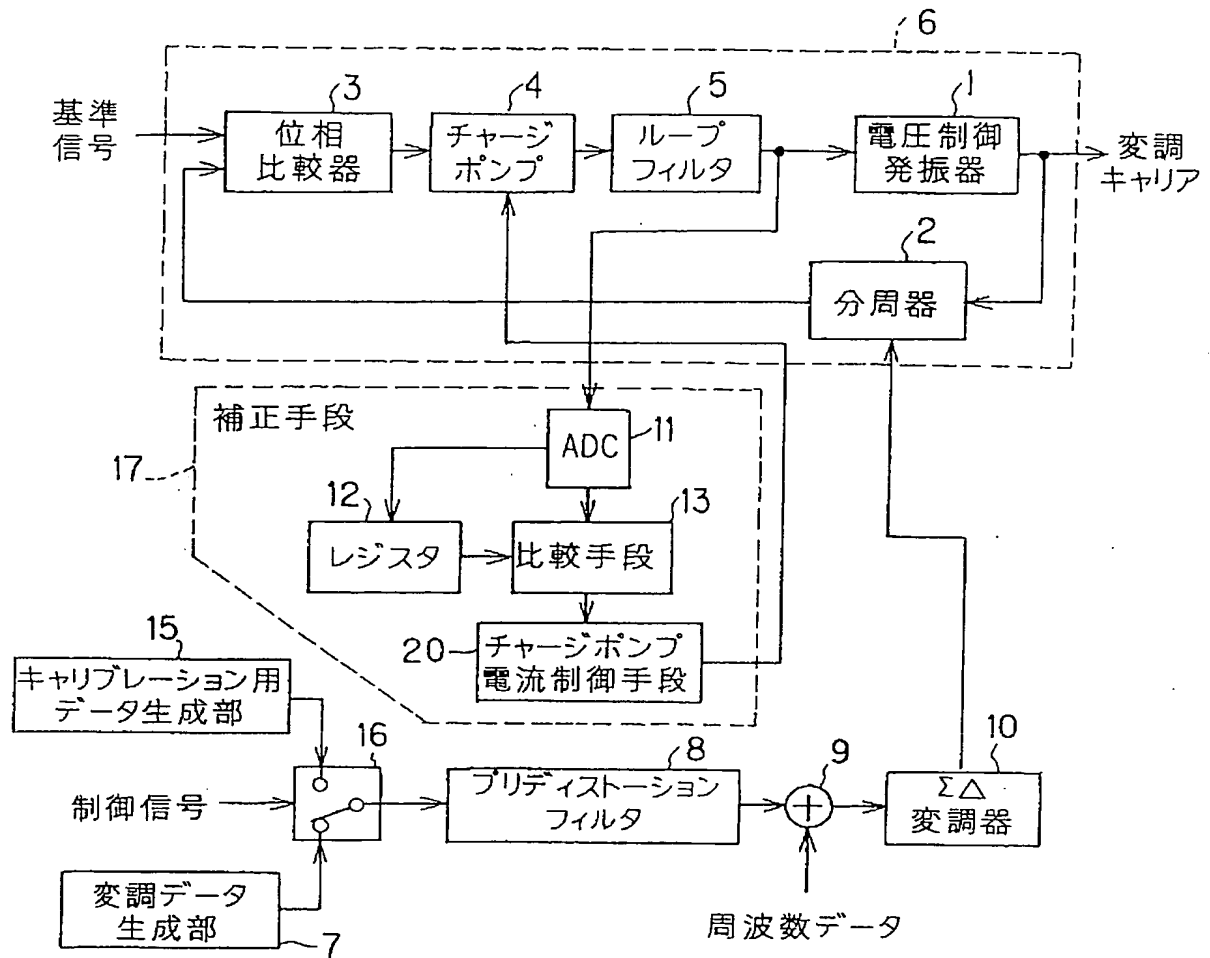


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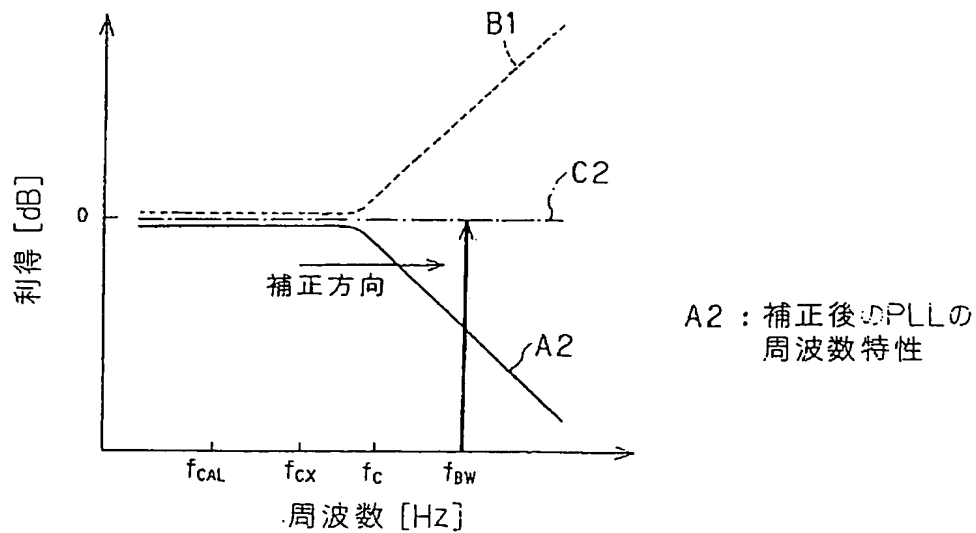


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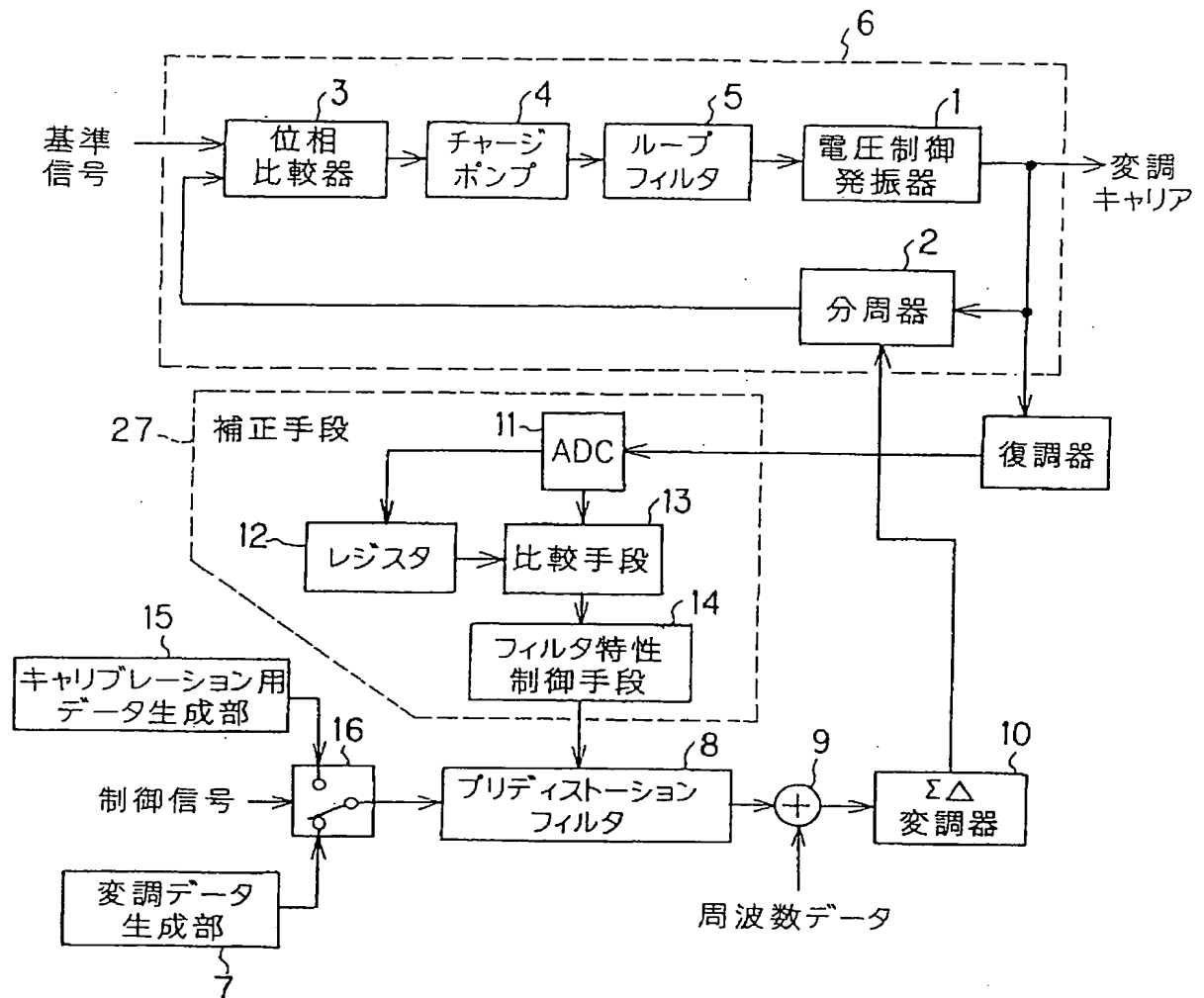


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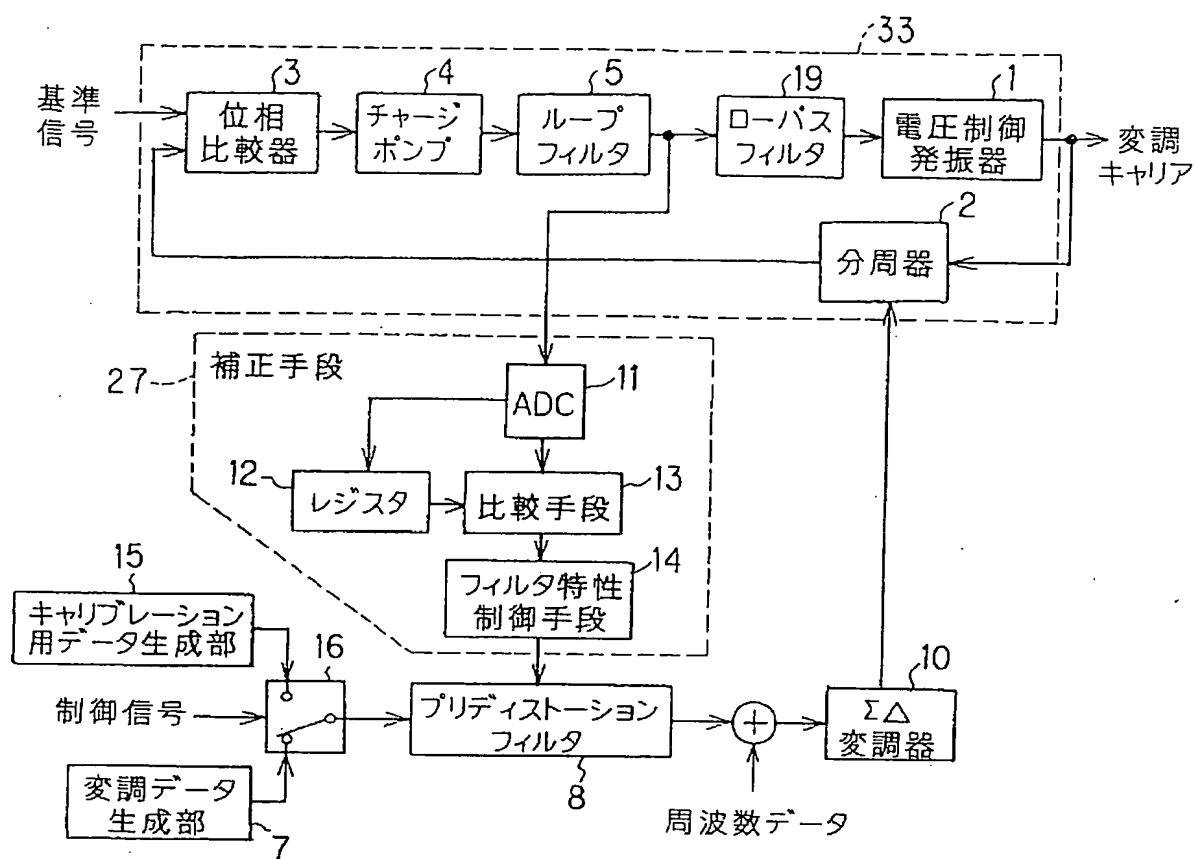


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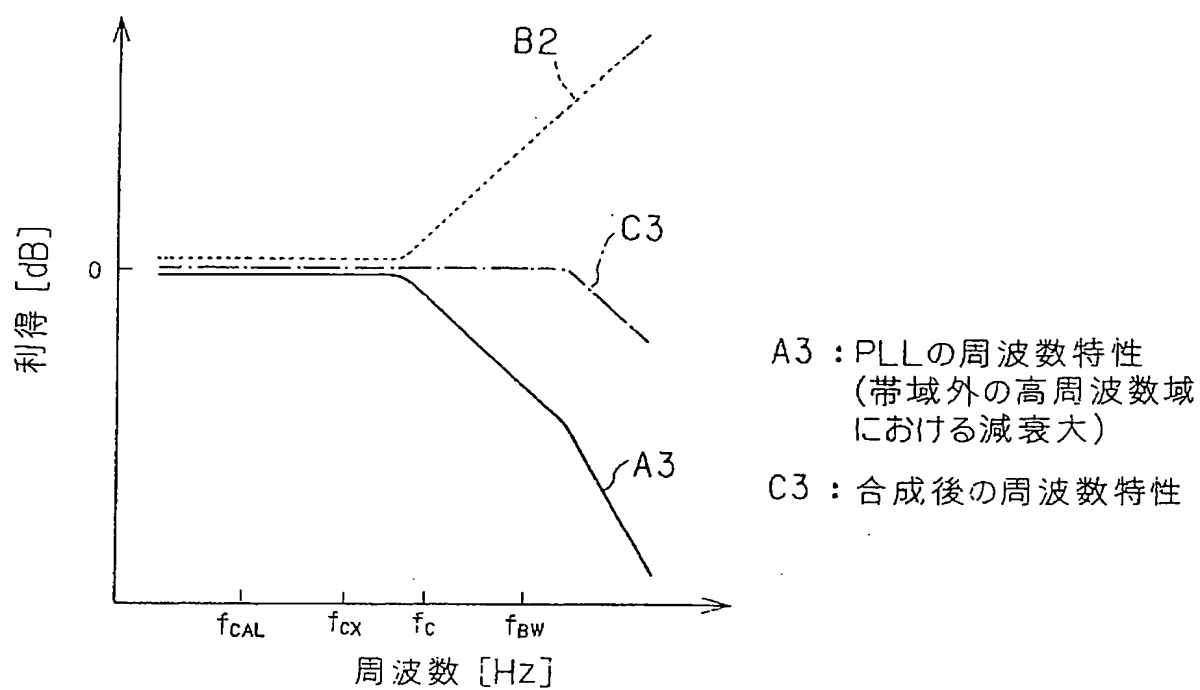


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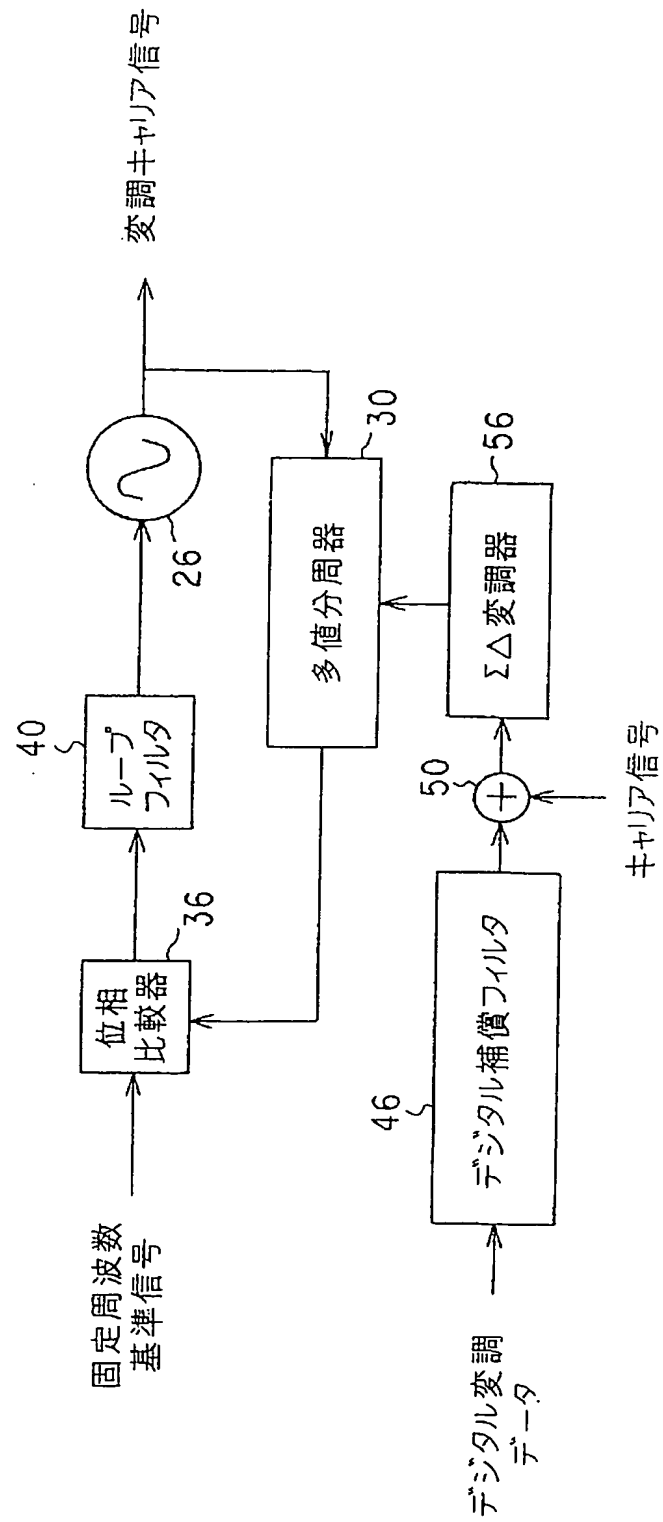


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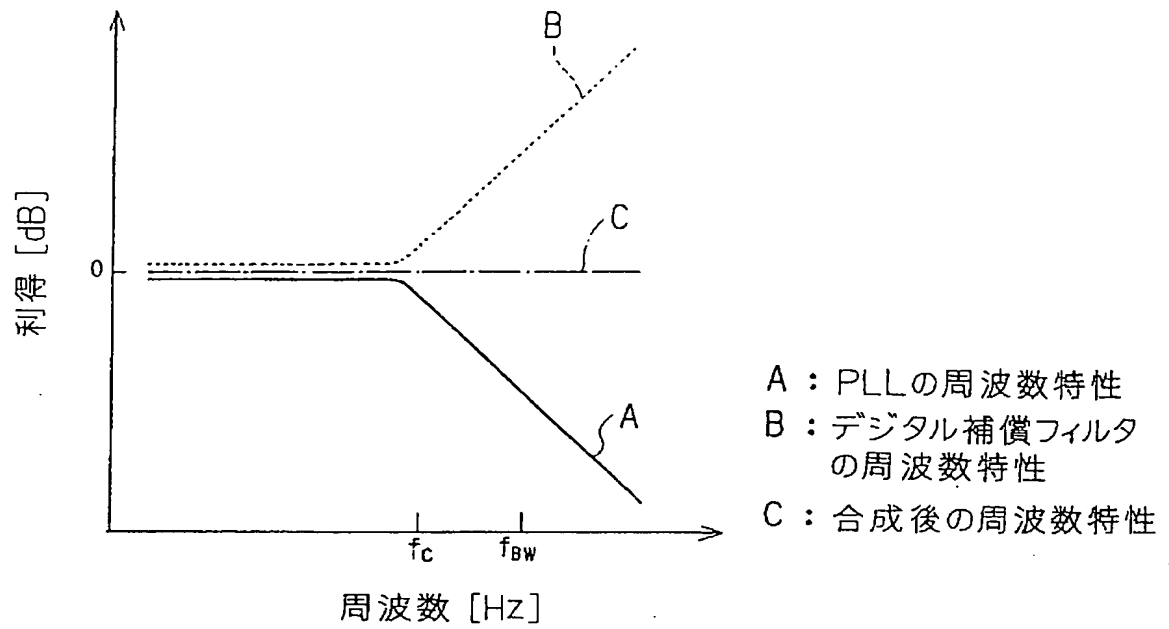


図 1 6

